

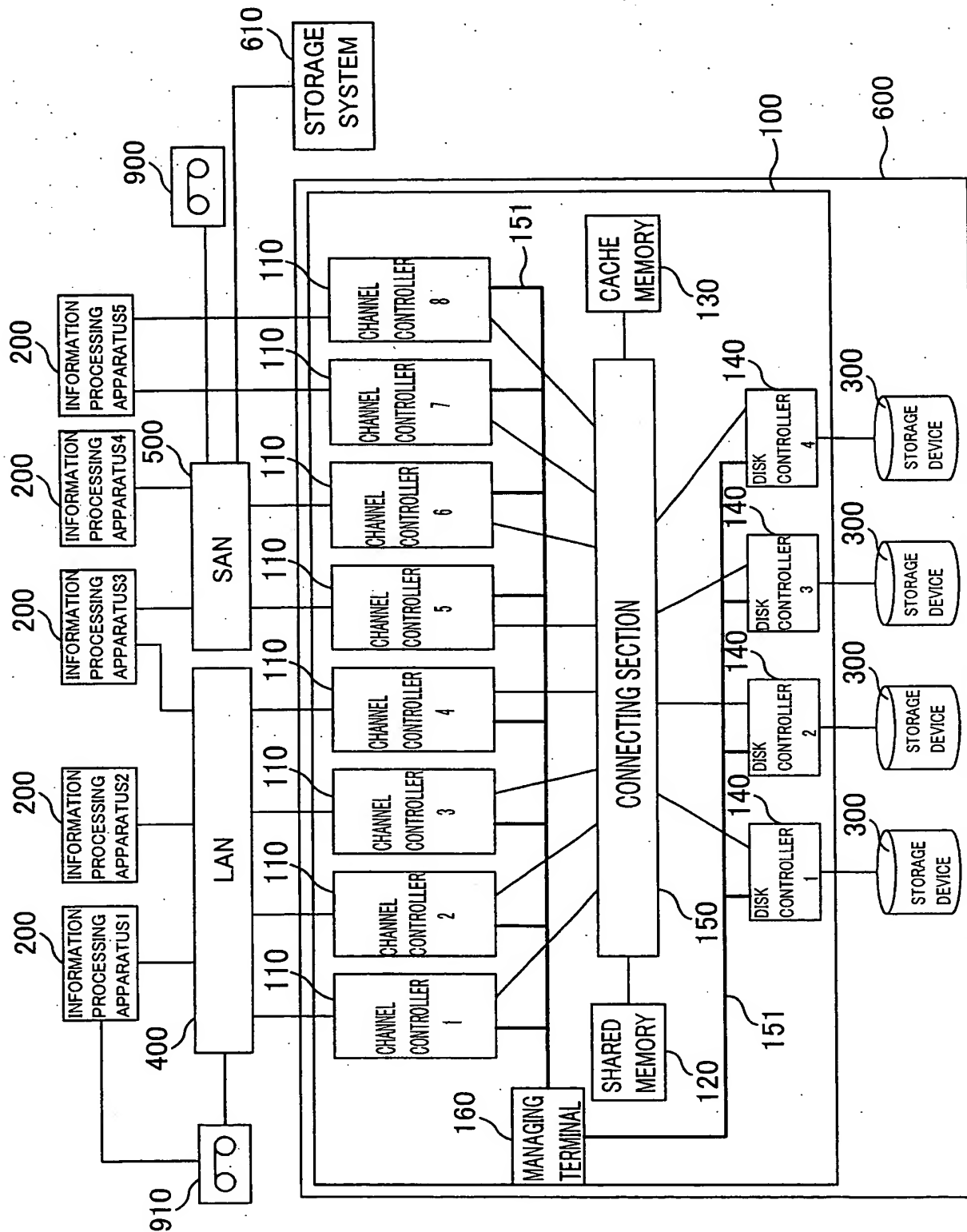
Applicant: Shinichi NAKAYAMA, et al.

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FIG. 1



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FIG.2

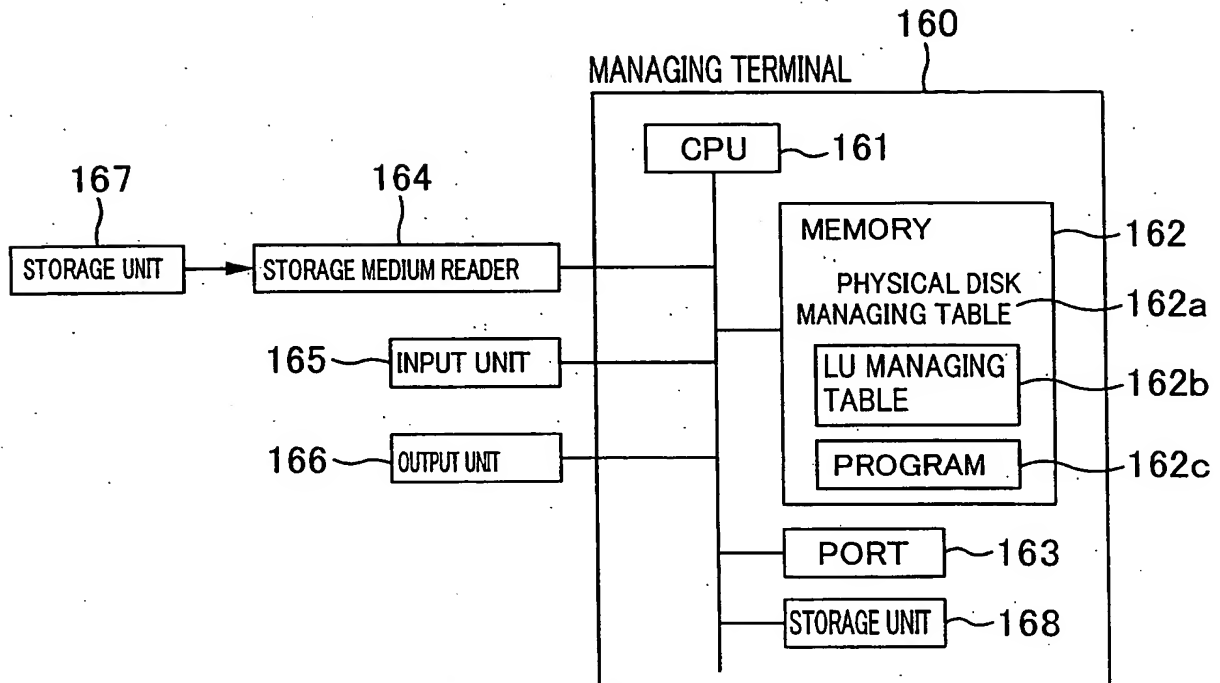


FIG.3

162a

PHYSICAL DISK MANAGING TABLE

DISK NUMBER	CAPACITY	RAID	USAGE STATE
#001	100GB	5	USED
#002	100GB	5	USED
#003	100GB	5	USED
#004	100GB	5	USED
#005	100GB	5	USED
#006	50GB	—	UNUSED
⋮	⋮	⋮	⋮

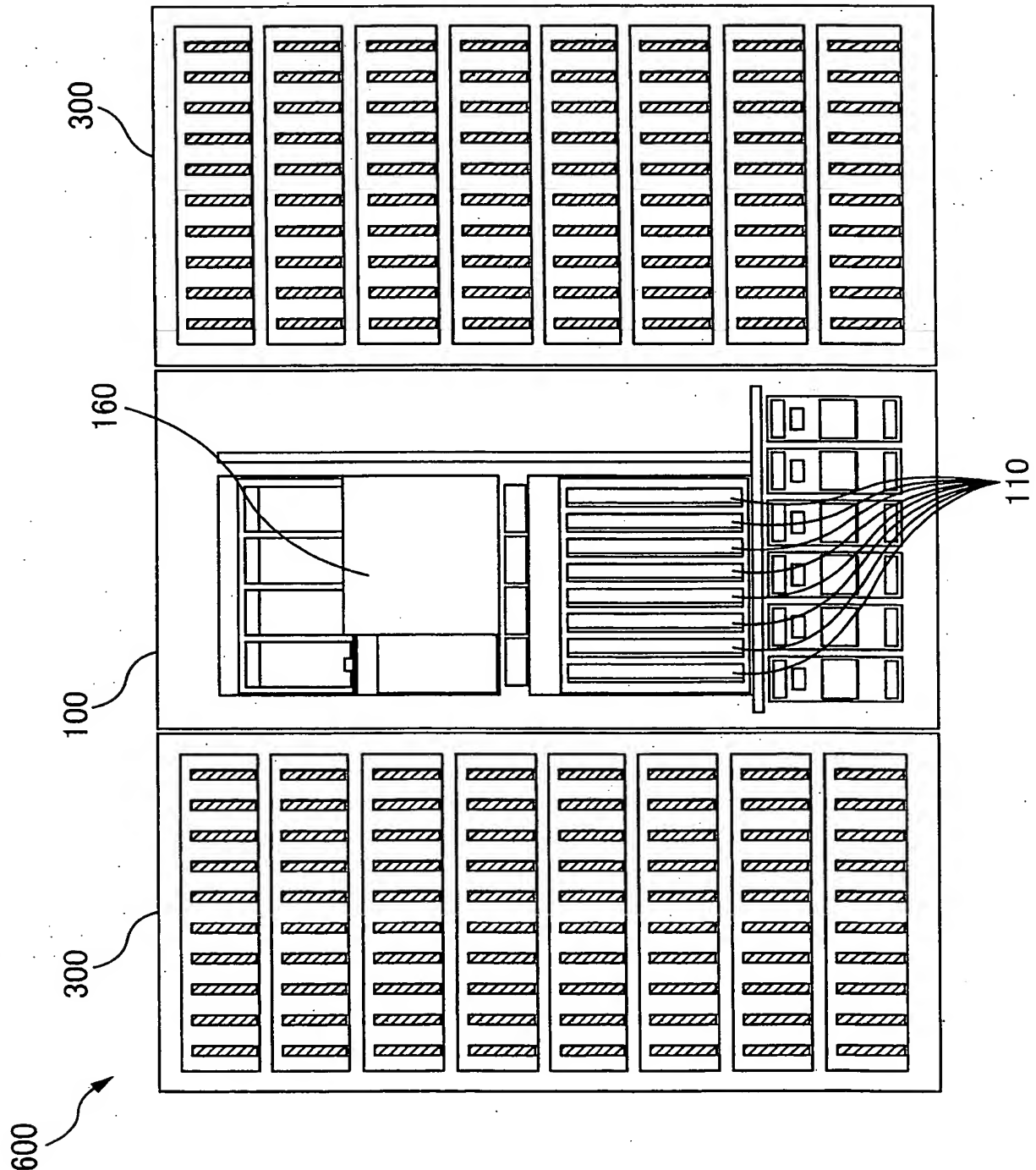
FIG.4

162b

LU MANAGING TABLE

LU NUMBER	PHYSICAL DISK	CAPACITY	RAID
#1	#001,#002,#003,#004,#005	100GB	5
#2	#001,#002,#003,#004,#005	300GB	5
#3	#006,#007,	200GB	1
⋮	⋮	⋮	⋮

FIG.5



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FIG. 6

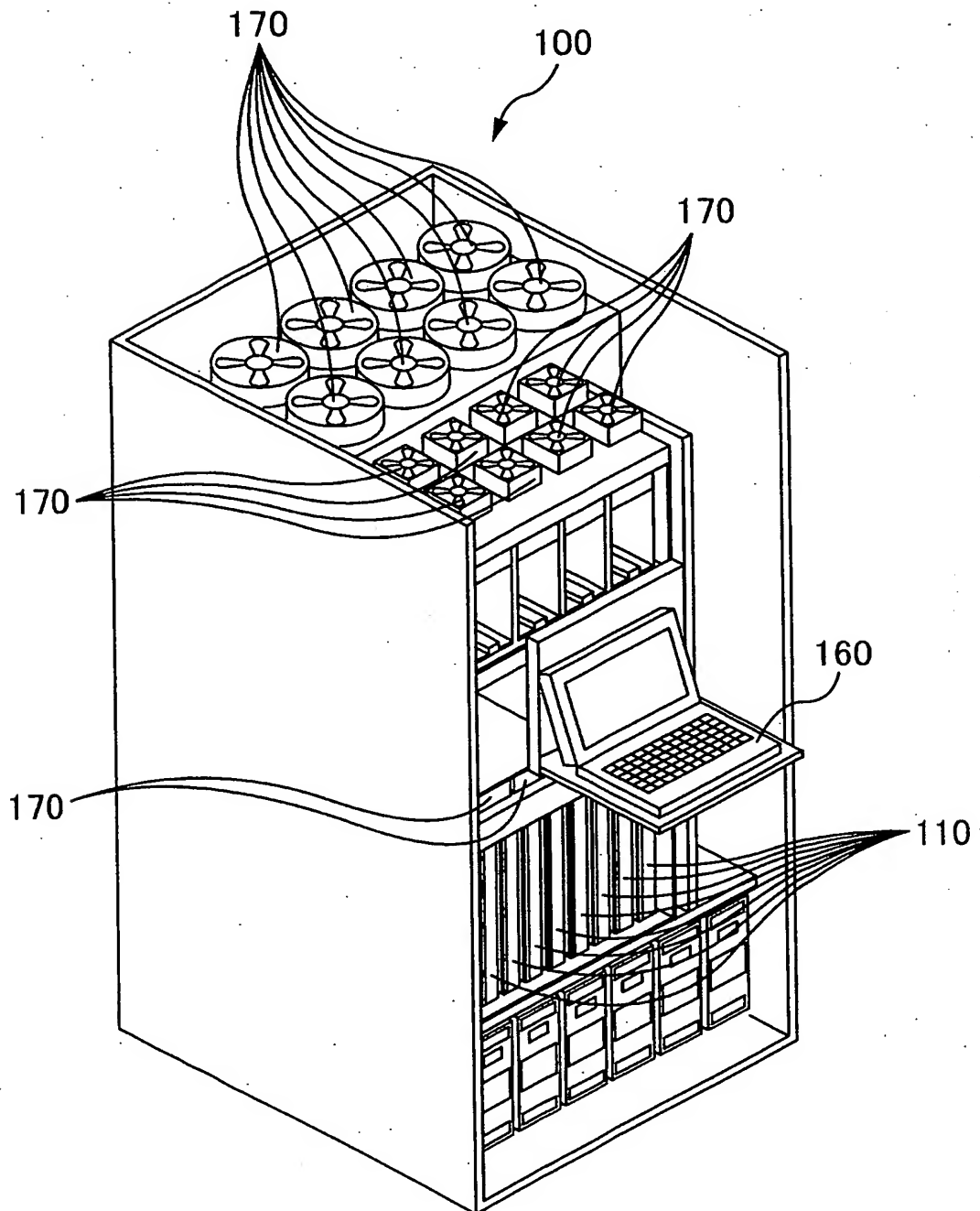


FIG. 7

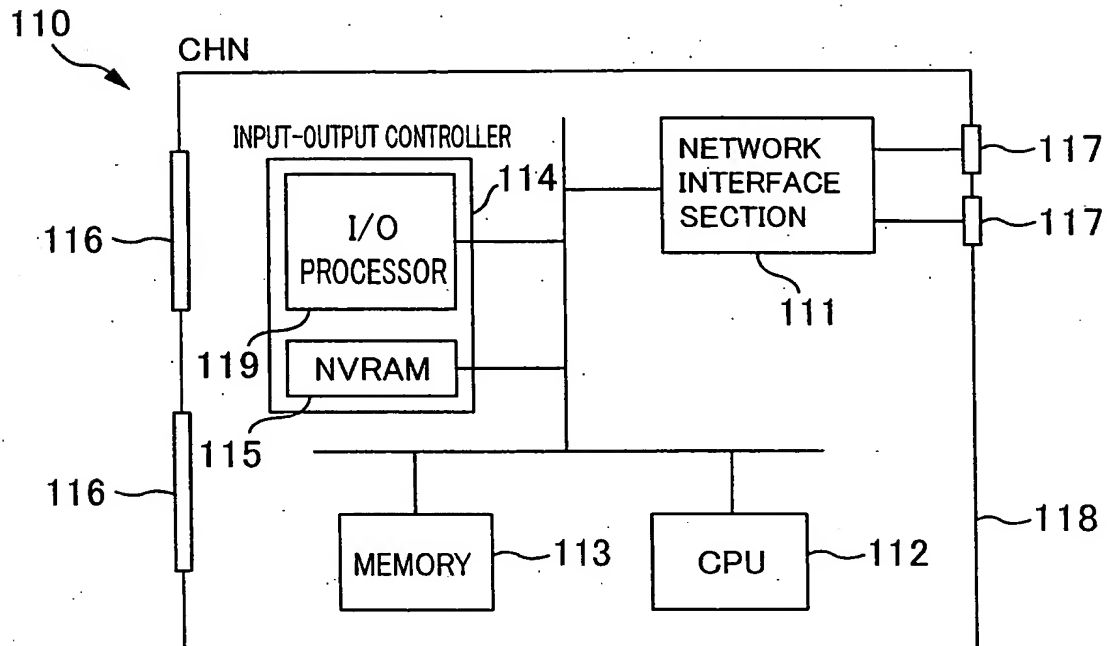
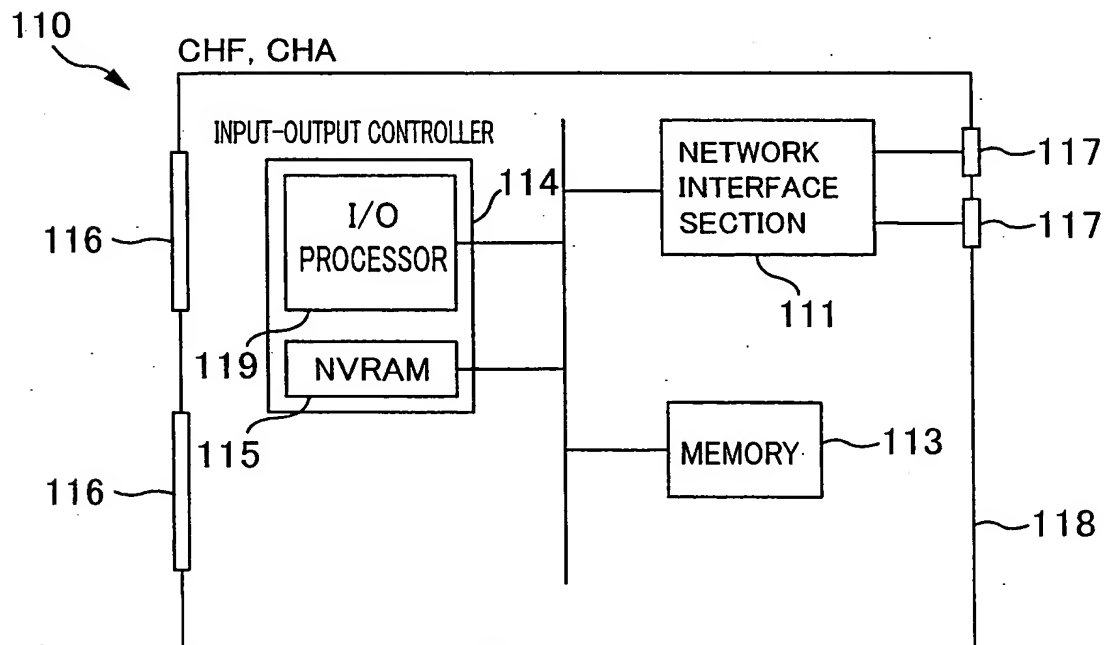


FIG. 8



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FIG. 9

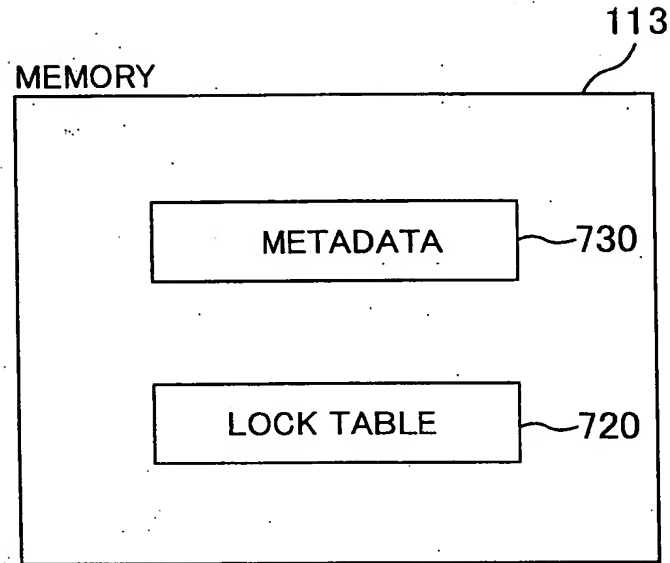
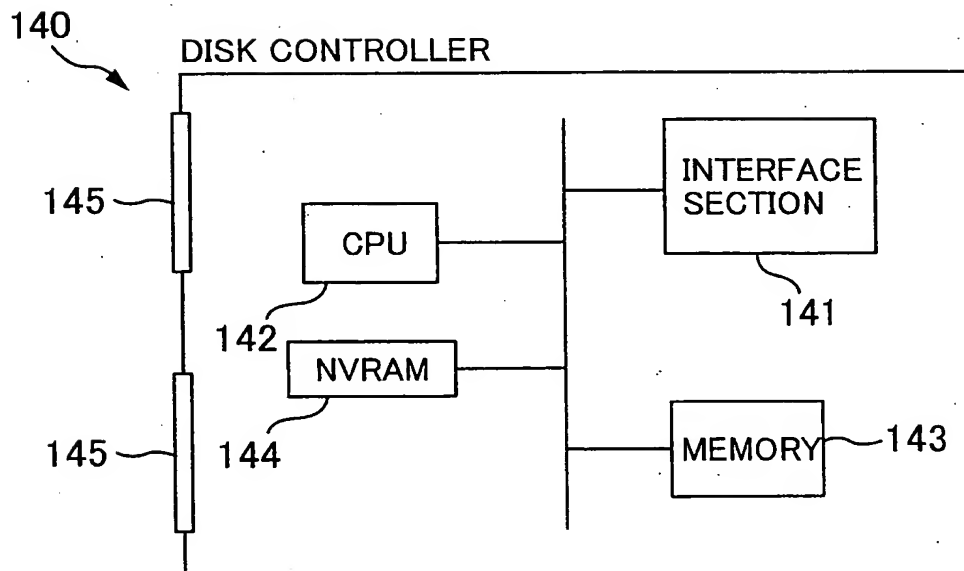


FIG. 10



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FIG.11

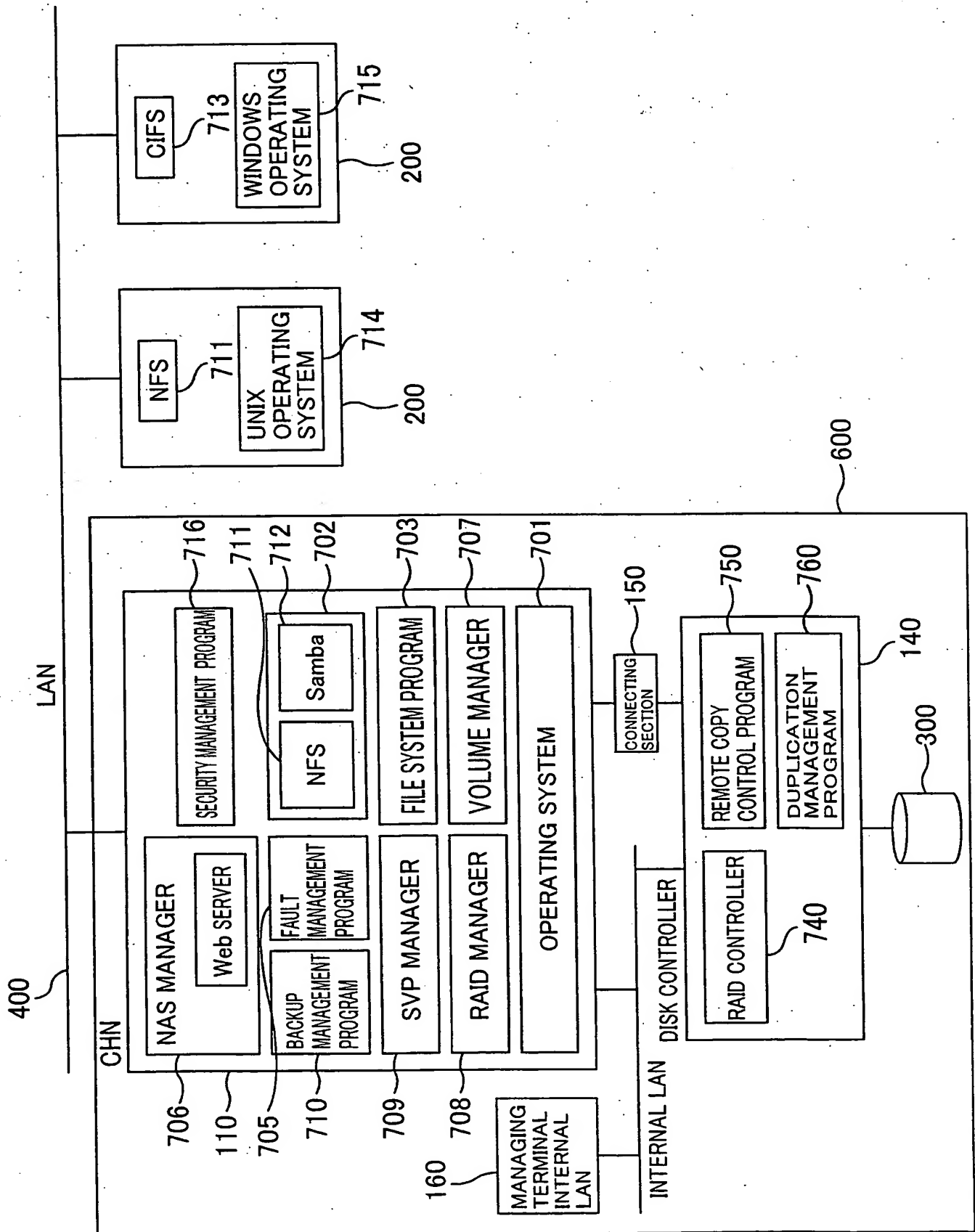
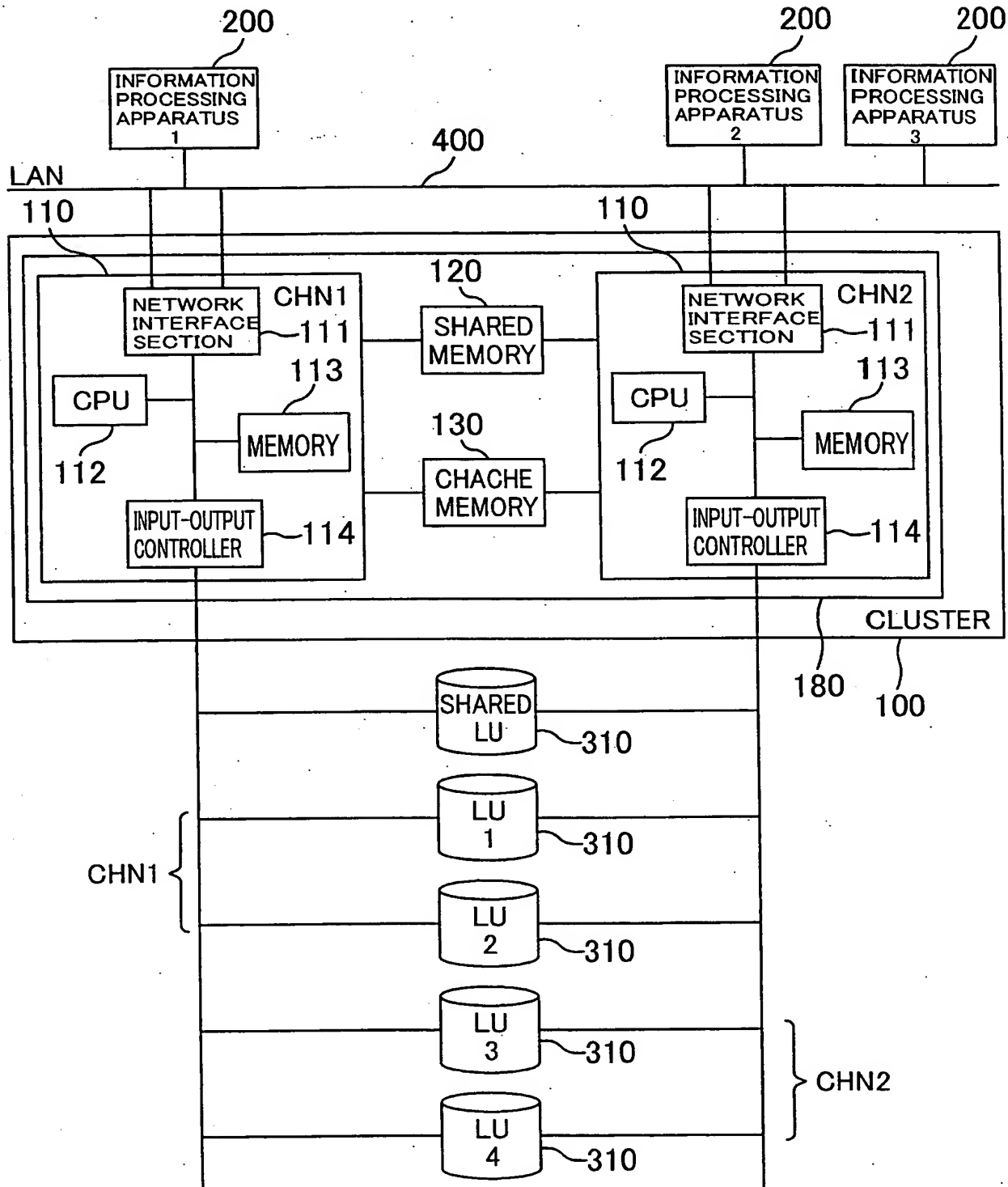


FIG.12



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FIG.13

730

METADATA

FILE NAME	TOP ADDRESS	CAPACITY	OWNER	UPDATE TIME
A	7BSA	200MB	X	0:00
B	05BF	50MB	X	7:57
C	1F30	100MB	Y	9:15
D	470B	100MB	Z	15:20
⋮	⋮	⋮	⋮	⋮

FIG.14

721

FILE LOCK TABLE

FILE NAME	LOCK/UNLOCK
A	LOCKED
B	—
C	—
D	LOCKED
⋮	⋮

722

LU LOCK TABLE

LU	LOCK/UNLOCK
SHARED	—
1	LOCKED
2	—
⋮	⋮

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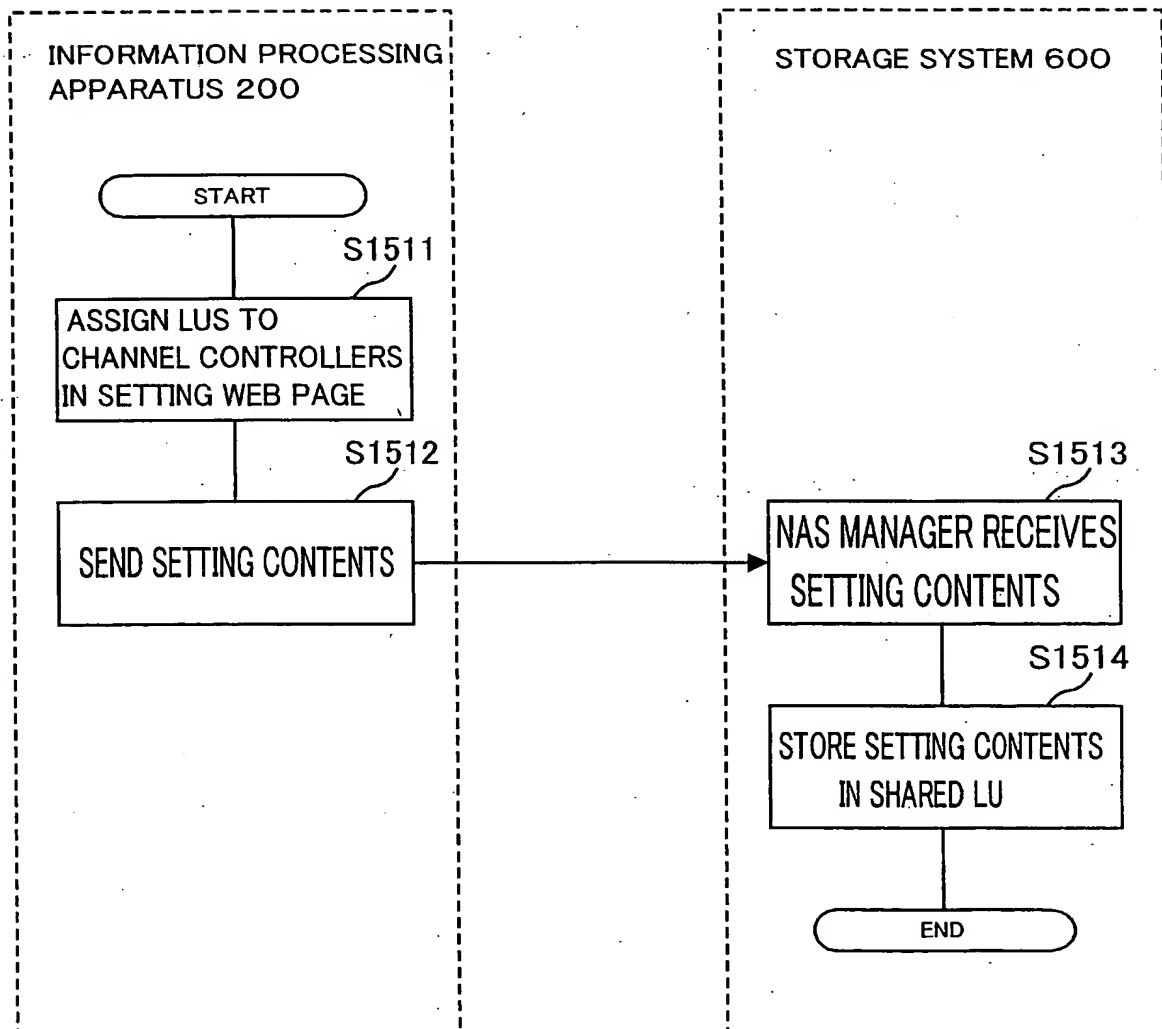
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FIG.15



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FIG.16

1600



CHANNEL CONTROLLER'S ID	LUN
CHN1	1, 2, 3
CHN2	1, 4, 5
CHN3	1, 6, 7
CHN4	1, 8
CHF5	1, 9
CHF6	1, 10
CHA7	1, 11
CHA8	1, 12

LU NUMBER	WHOLE CAPACITY (GB)	USAGE AMOUNT (GB)	ACCESS FREQUENCY (TIMES / MIN.)
#1	10	3	10
#2	20	1.5	5
#3	20	2	4
#4	10	2.3	4
#5	20	4.5	0
#6	20	6	23

OK

CANCEL

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FIG.17

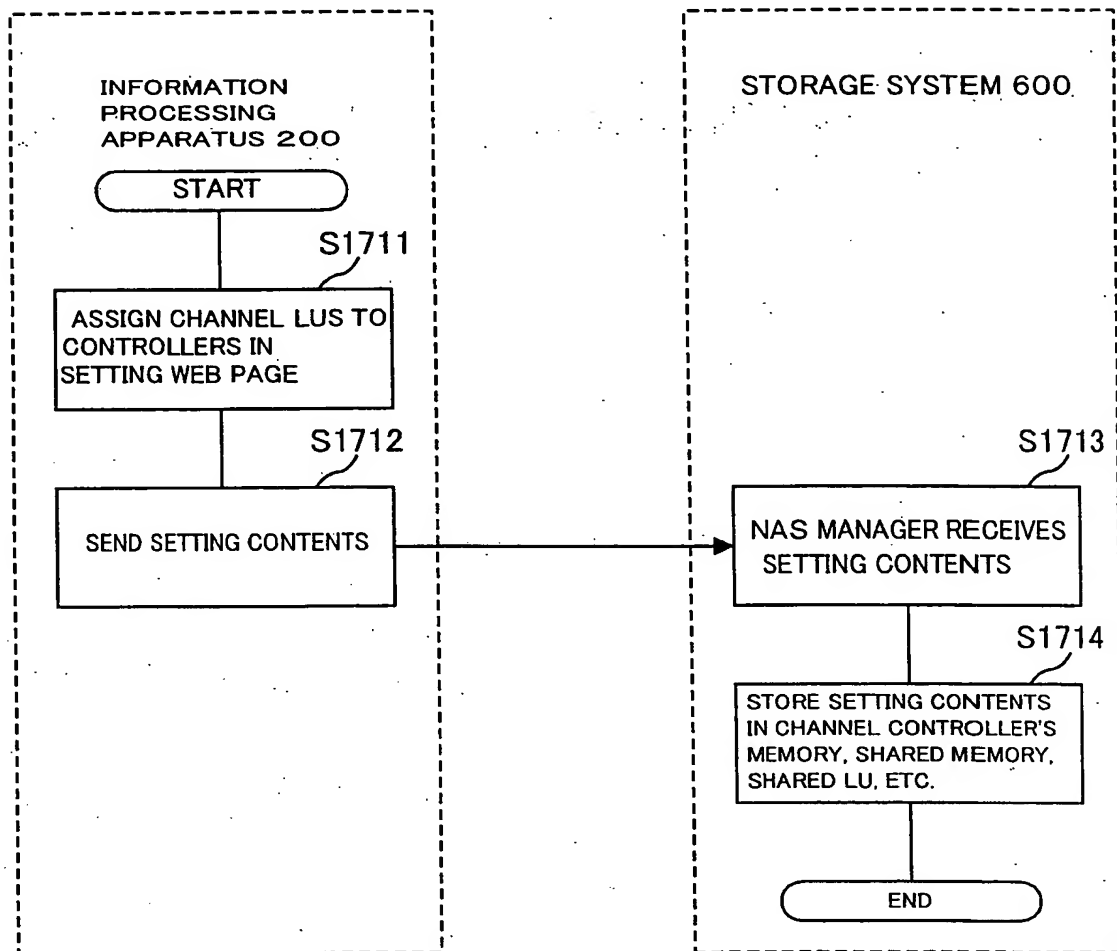


FIG.18

1800

CHANNEL CONTROLLER'S ID	INFORMATION PROCESSING APPARATUS'S ID
CHN1	192.168.0.1,192.168.0.2
CHN2	192.168.0.5,192.168.0.6
CHN3	192.168.0.10
CHN4	192.168.0.20,192.168.0.21
CHF5	
CHF6	
CHA7	
CHA8	

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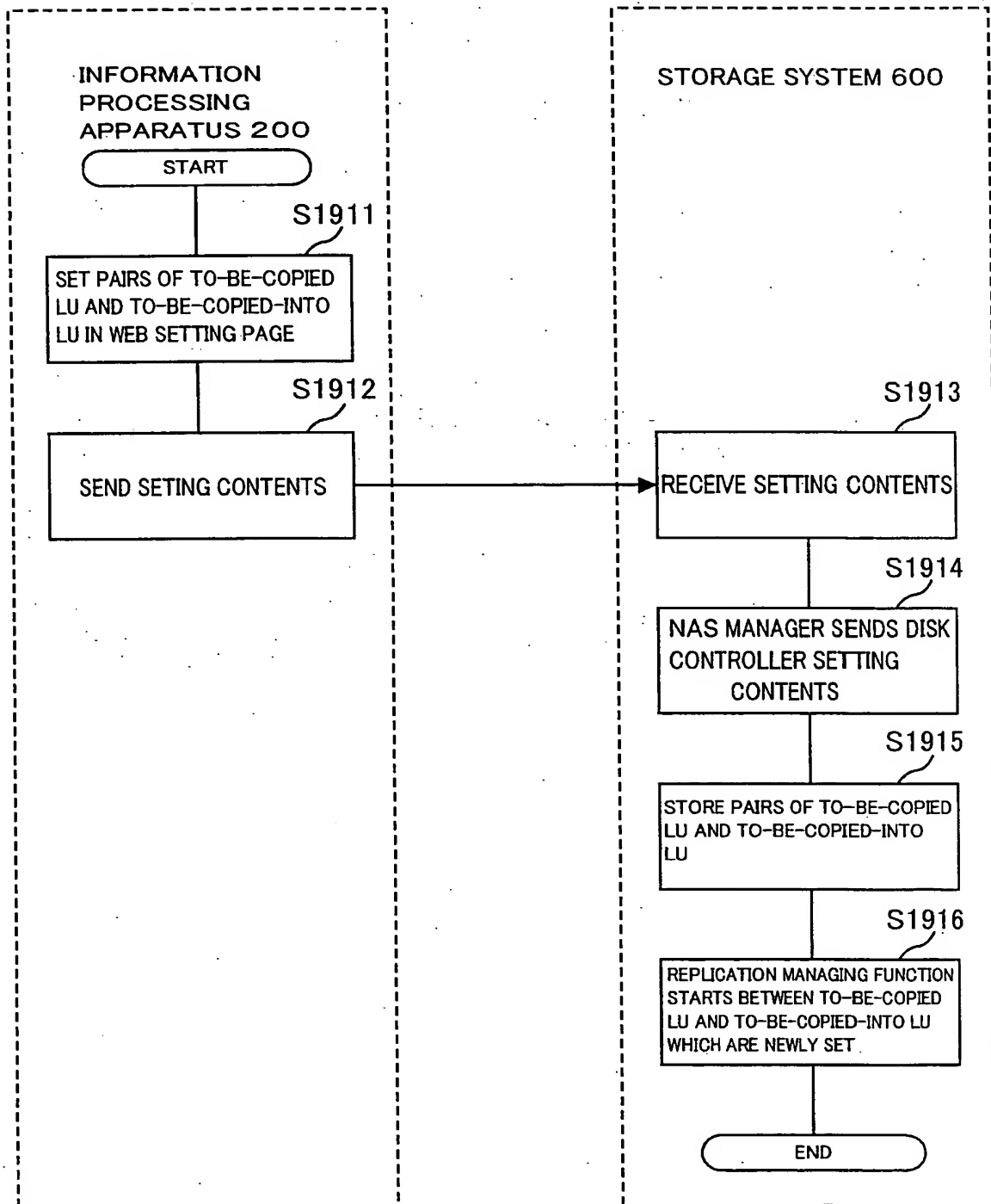
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FIG.19



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FIG.20

2000

TO-BE-COPIED LU (LUN)	TO-BE-COPIED -INTO LU
1	10
2	11
3	12
4	13
5	14

OK CANCEL

FIG.21

2100

TO-BE-COPIED LU (LUN)	TO-BE-COPIED -INTO LU	SPLIT
1	10	EXECUTION ▼
2	11	▼
3	12	▼
4	13	▼
5	14	▼

OK CANCEL

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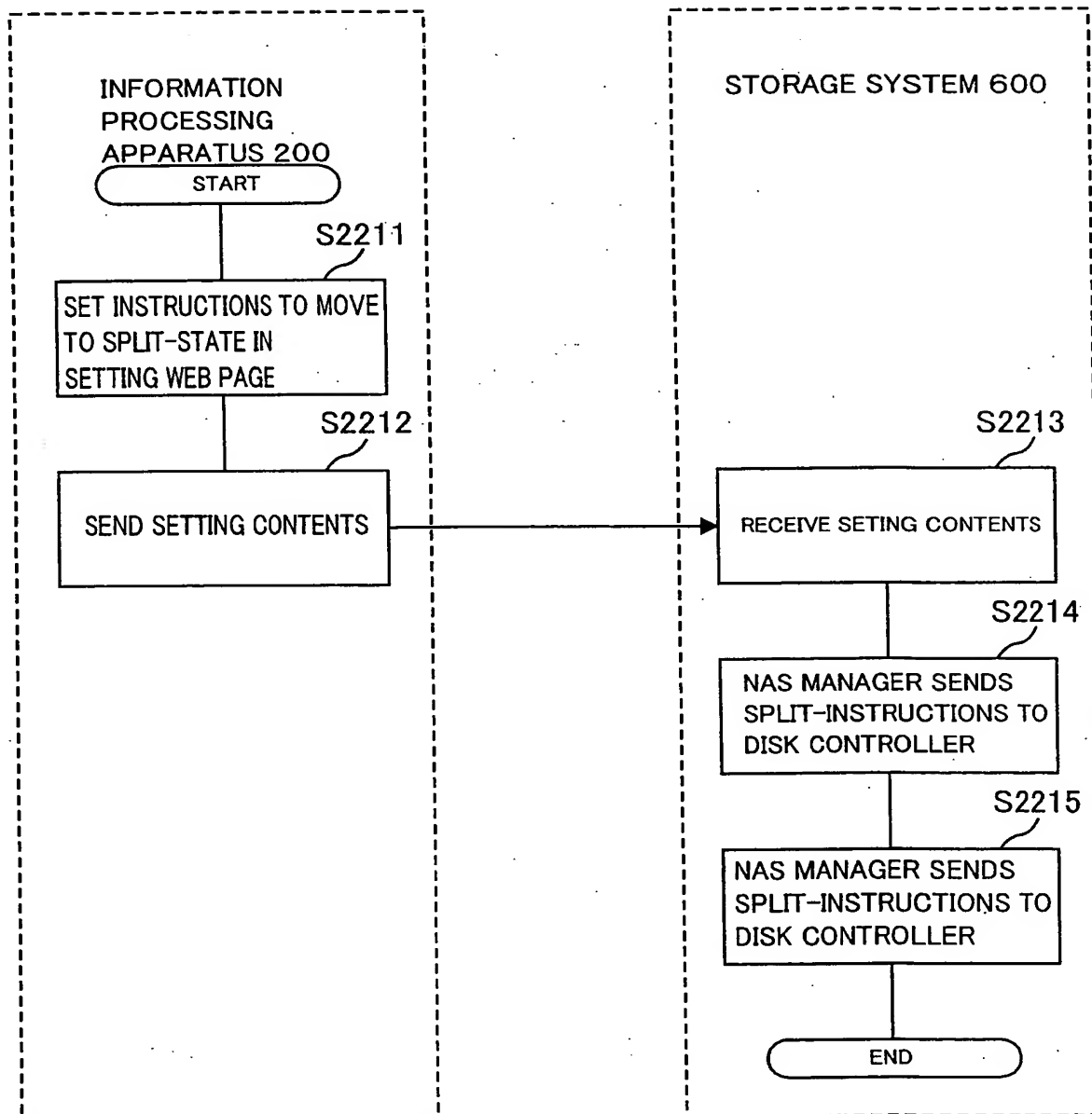
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FIG.22



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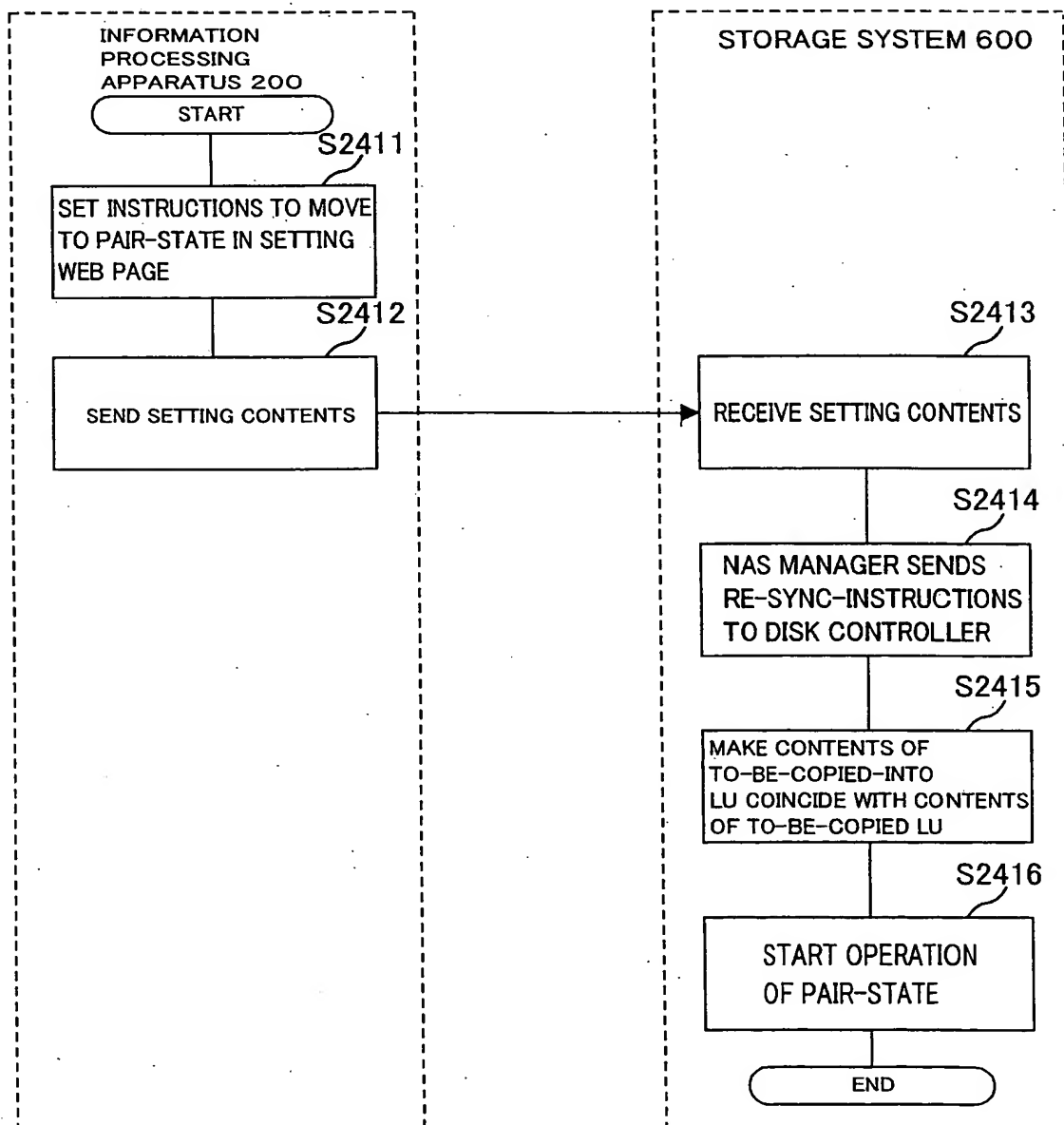
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FIG. 23

2300

TO-BE-COPIED LU(LUN)	TO-BE-COPIED LU(LUN)	RE-SYNC	
1	10	EXECUTION	▽
2	11		▽
3	12		▽
4	13		▽
5	14		▽

FIG. 24



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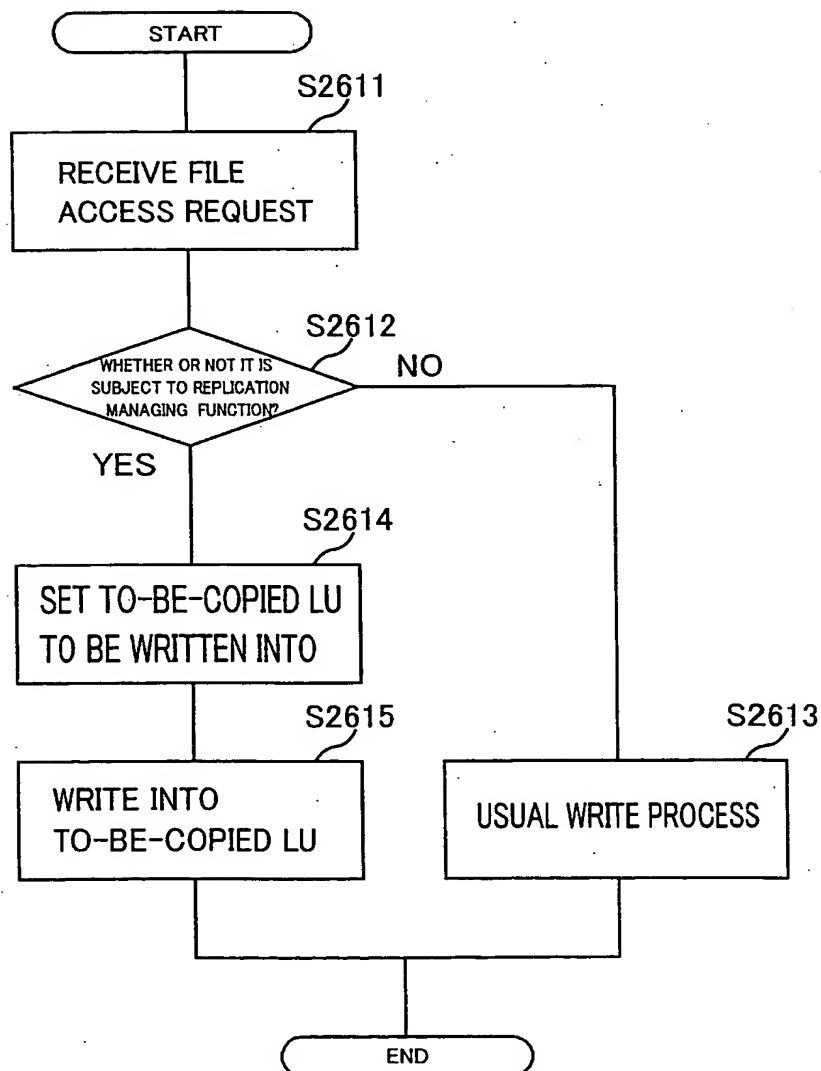
FIG.25

2500

FILE NAME	DIRECTORY NAME
FILE1	DIR1
FILE2	DIR2
FILE3	
FILE4	

OK CANCEL

FIG.26



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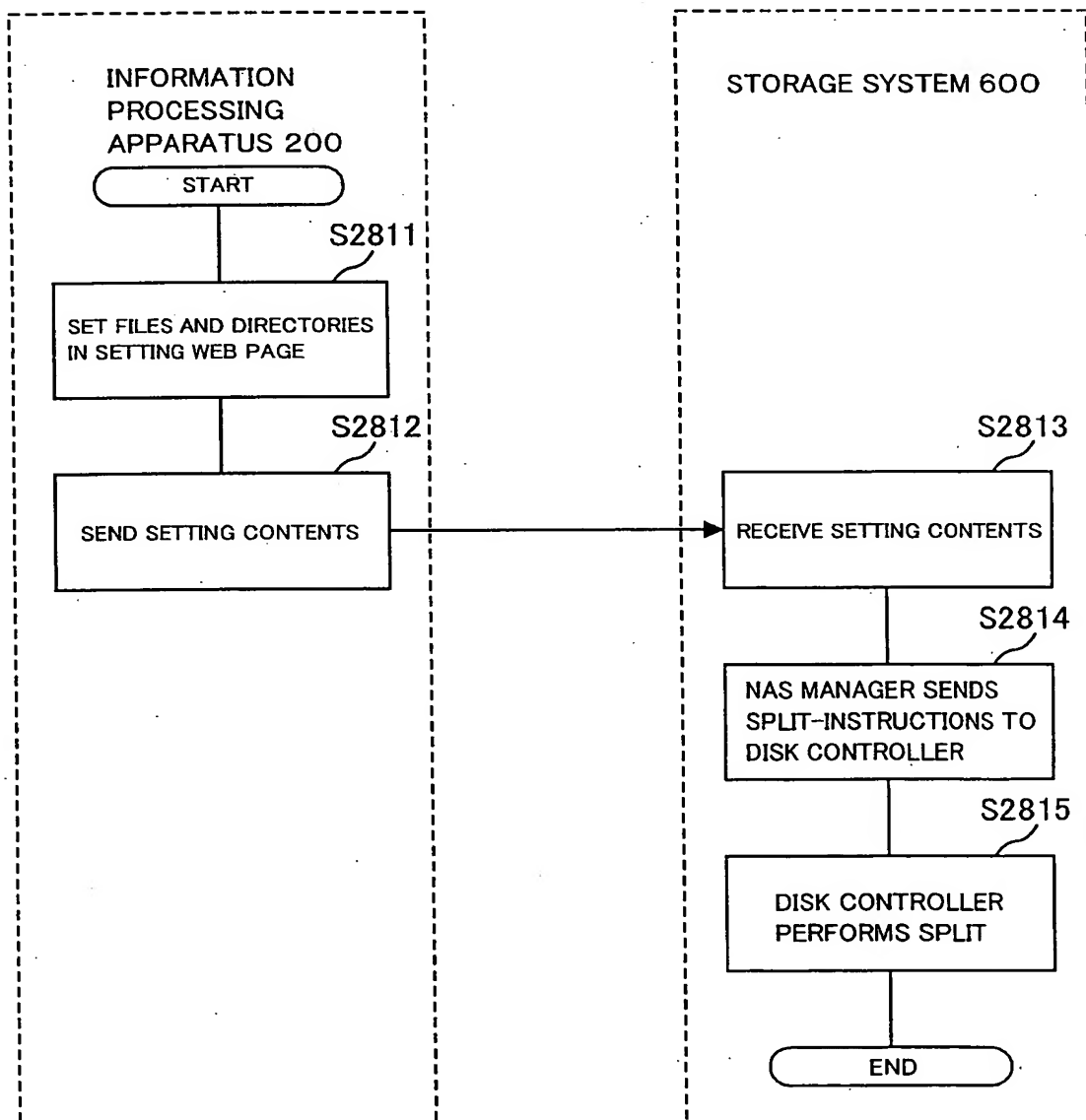
FIG.27

2700

FILE NAME	DIRECTORY NAME
FILE1	DIR1
FILE2	DIR2
FILE3	
FILE4	

SPECIFIED	2003/1/30	1:00
DATE/TIME	2003/1/30	2:00

FIG.28



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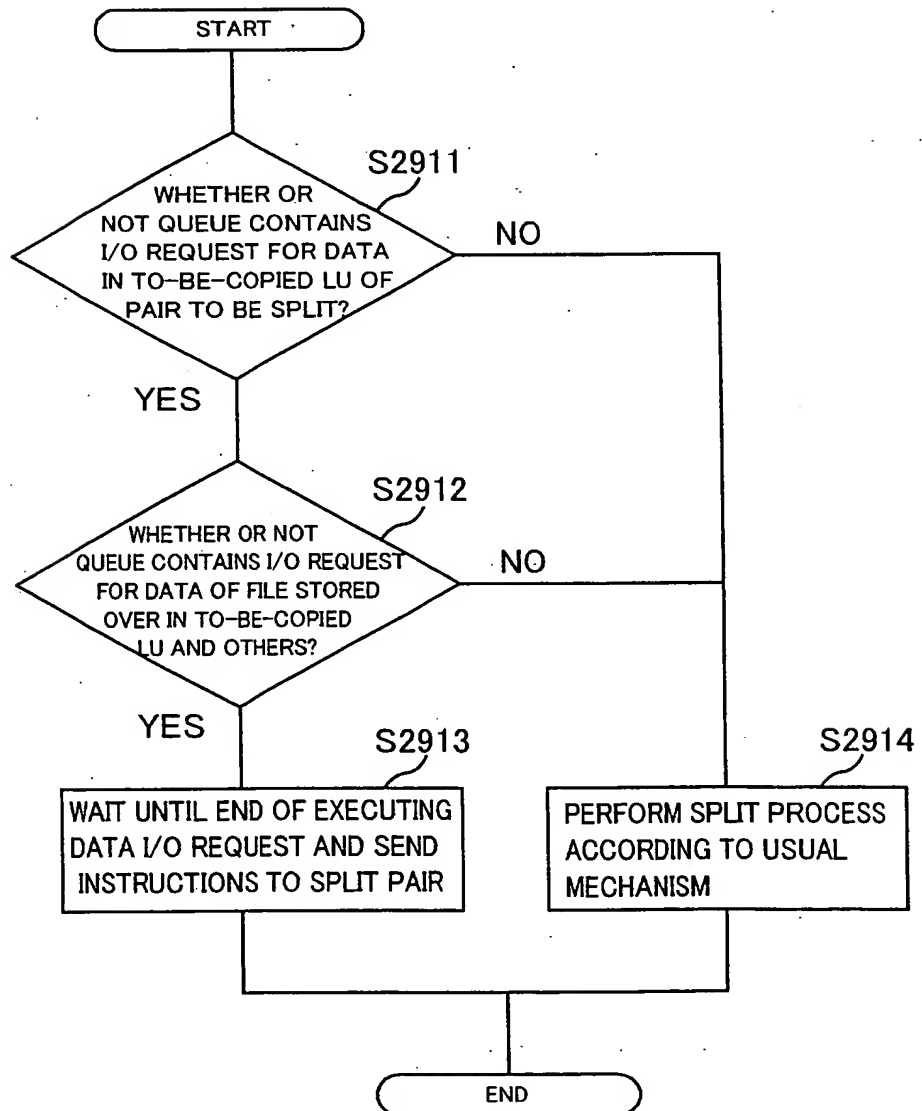
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FIG.29



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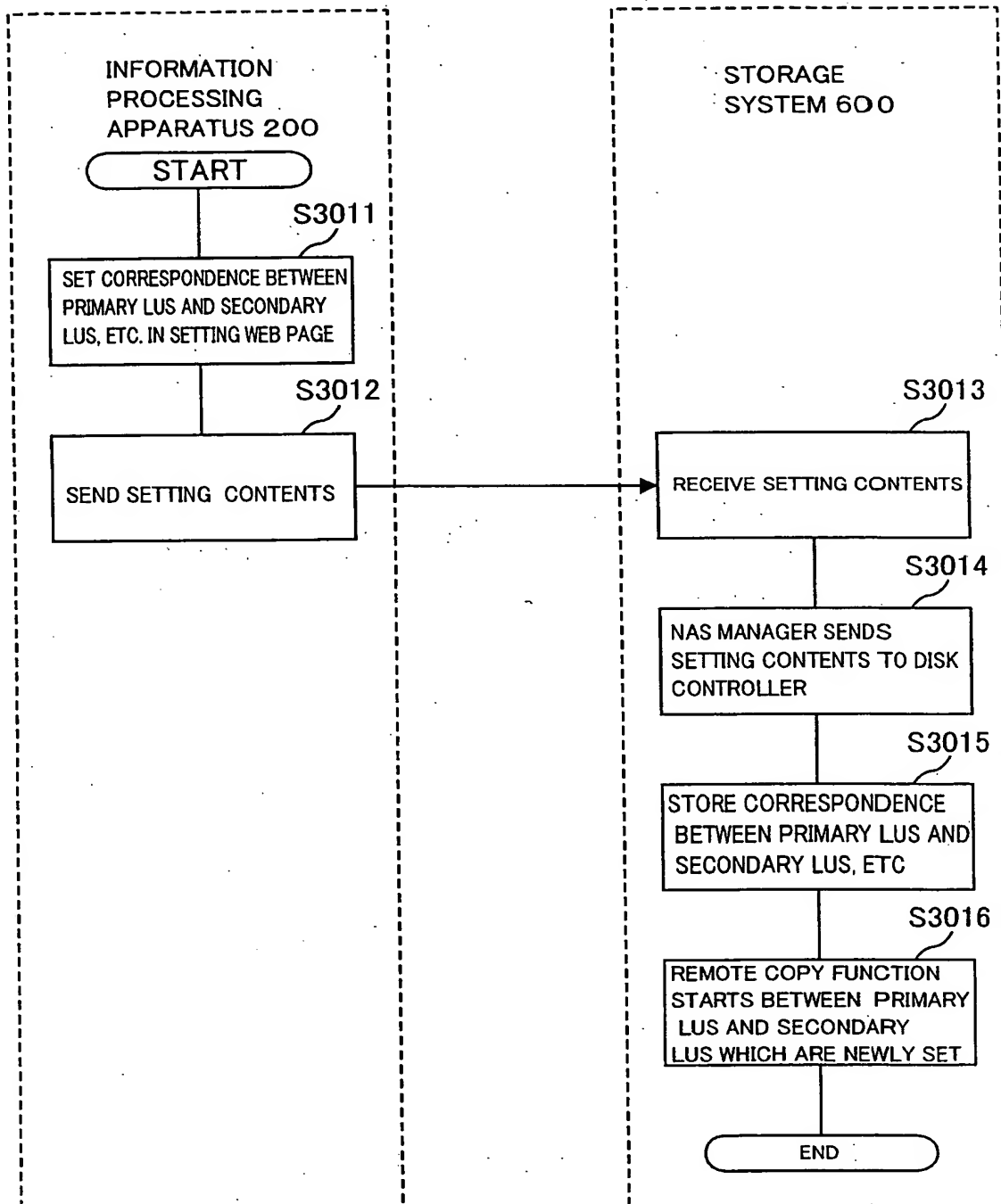
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FIG.30



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FIG.31

3100

PRIMARY LU (LUN)	SECONDARY LU (LUN)	MODE	
1	10	SYNCHRONOUS	▽
2	11	ASYNCHRONOUS	▽
3	12	ASYNCHRONOUS	▽
4	13	ASYNCHRONOUS	▽
5	14	SYNCHRONOUS	▽

FIG.32

3200

FILE名	DIRECTORY NAME
FILE1	DIR1
FILE2	DIR2
FILE3	
FILE4	

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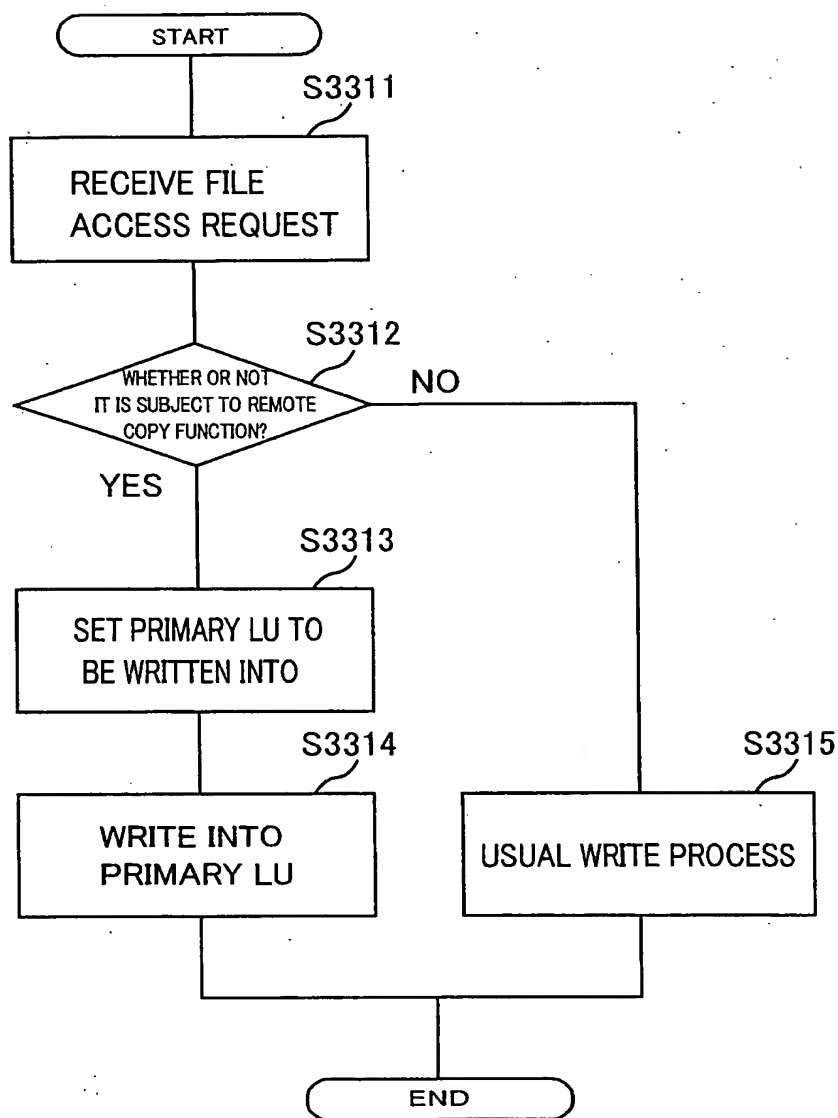
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FIG.33



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FIG.34

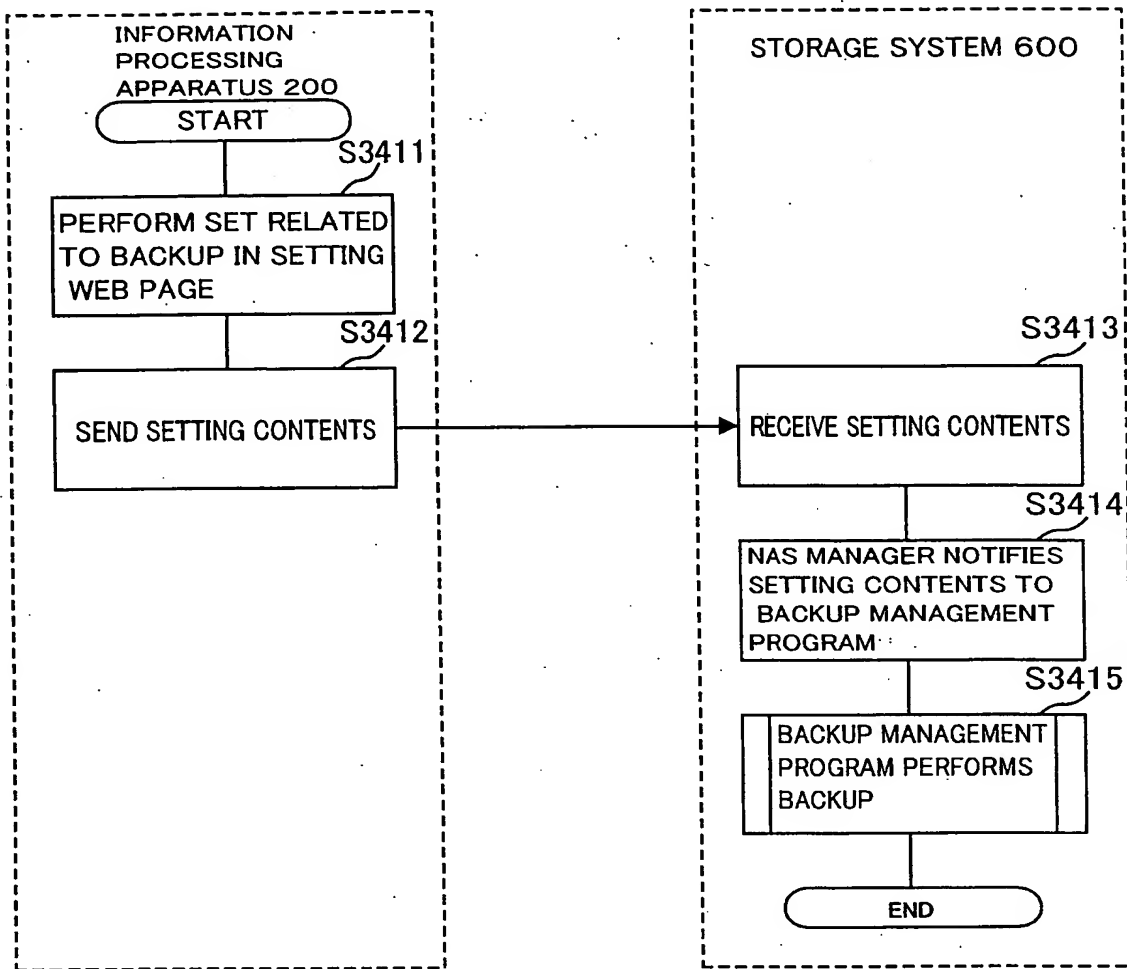


FIG.35

BACKUP UNIT	OBJECT	BACKUP DATE/TIME	DATA TRANSMISSION MODE
FILE NAME	FILE1, FILE2	2003/2/10	LAN
LUN	1, 2	EVERY WEDNESDAY	SAN
VIRTUALIZED LOGICAL VOLUME	VOL1, VOL2	DAILY AT0:00	SAN

3500

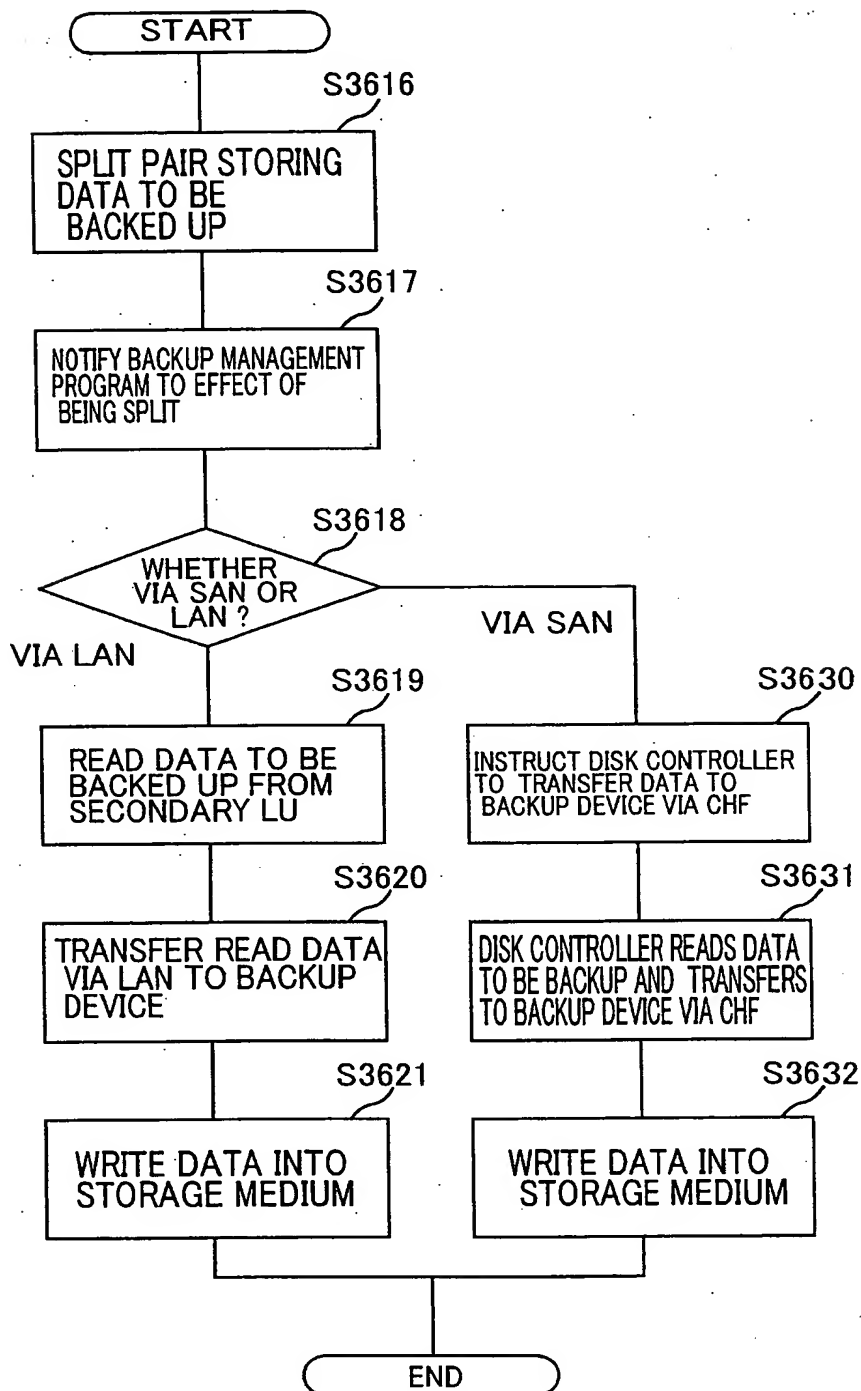
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FIG.36



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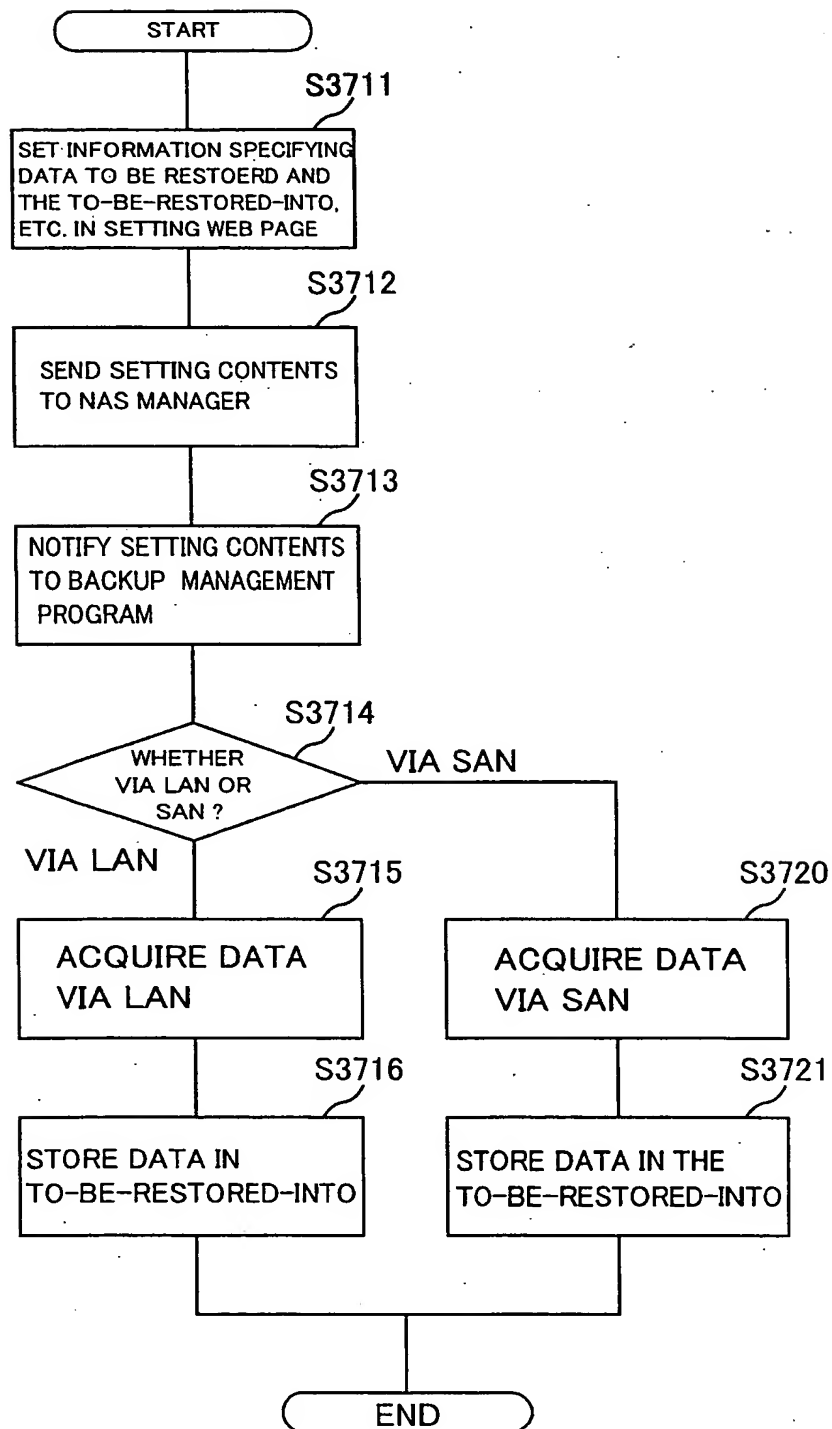
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FIG.37



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FIG.38

3800

RESTORATION UNIT	OBJECT	POSITION	THE TO-BE-RESTORED-INTO
FILE NAME	FILE1, FILE2	2003/3/10	DIR1
LUN	1, 2		1, 2
VIRTUALIZED LOGICAL VOLUME	VOL1, VOL2		VOL1, VOL2

OK CANCEL

FIG.39

3900

TARGET STORAGE SYSTEM	APPARATUS 1
TARGET NAS BOARD	CHN1

PRODUCT NAME	TYPE	VERSION	VERSION DATE	UPDATE DATE	UPDATED FILE NAME
OPERATING SYSTEM	OS	2. 7. 3. 5	37575	2003/1/7	
NFS	MIDDLEWARE	3. 2. 4	2002/11/15	2003/1/7	nfs3-2-6
Samba(CIFS)	MIDDLEWARE	2. 1. 5. 6	2002/11/15	2003/1/7	
CXFS	MIDDLEWARE	7. 2. 1. 3	2002/11/15	2003/1/7	
XFS	MIDDLEWARE	6. 5. 4. 1	2002/11/15	2003/1/7	
VOLUME MANAGER	MIDDLEWARE	1. 1. 1. 2	2001/6/24	2002/4/15	
SVP MANAGER	MIDDLEWARE	2. 1. 5. 6	2001/6/24	2002/6/13	
RAID MANAGER	MIDDLEWARE	3. 5. 4	2001/6/26	2002/8/11	
BACKUP MANAGEMENT PROGRAM	MIDDLEWARE	6. 7. 9	2002/11/15	2002/10/9	
FAULT MANAGEMENT PROGRAM	MIDDLEWARE	1. 1. 8	2002/11/15	2002/12/7	
SECURITY MANAGEMENT PROGRAM	MIDDLEWARE	1. 1. 5	2002/11/15	2003/2/4	
NAS MANAGER	MIDDLEWARE	3. 6. 7	2002/11/15	2003/4/4	
REMOTE COPY CONTROL PROGRAM	FIRMWARE	1. 1. 4	2002/11/15	2003/6/2	Remote1-1-5
REPLICATION MANAGING PROGRAM	FIRMWARE	4. 4. 1	2002/11/15	2003/7/31	

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FIG.40

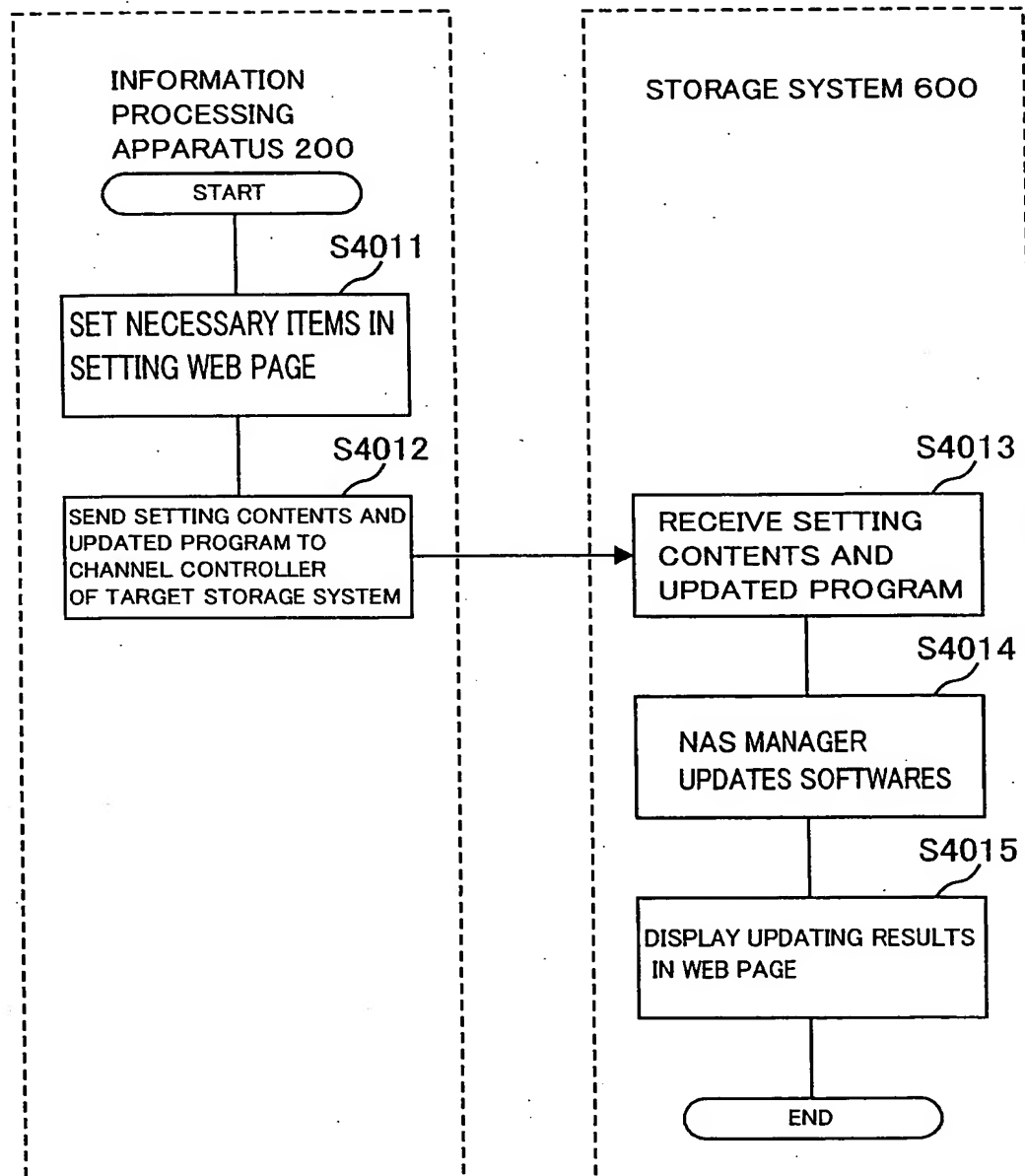


FIG.41

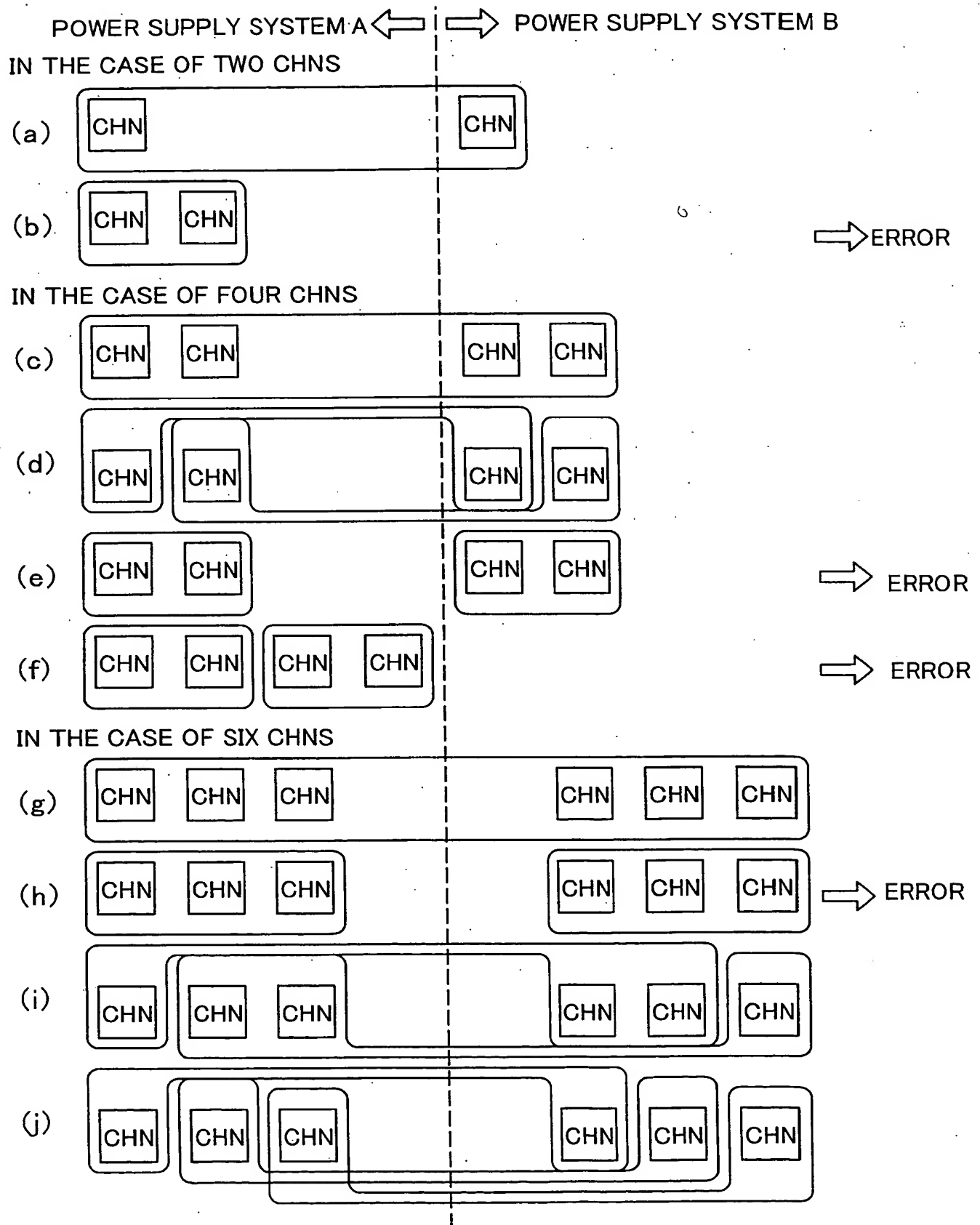
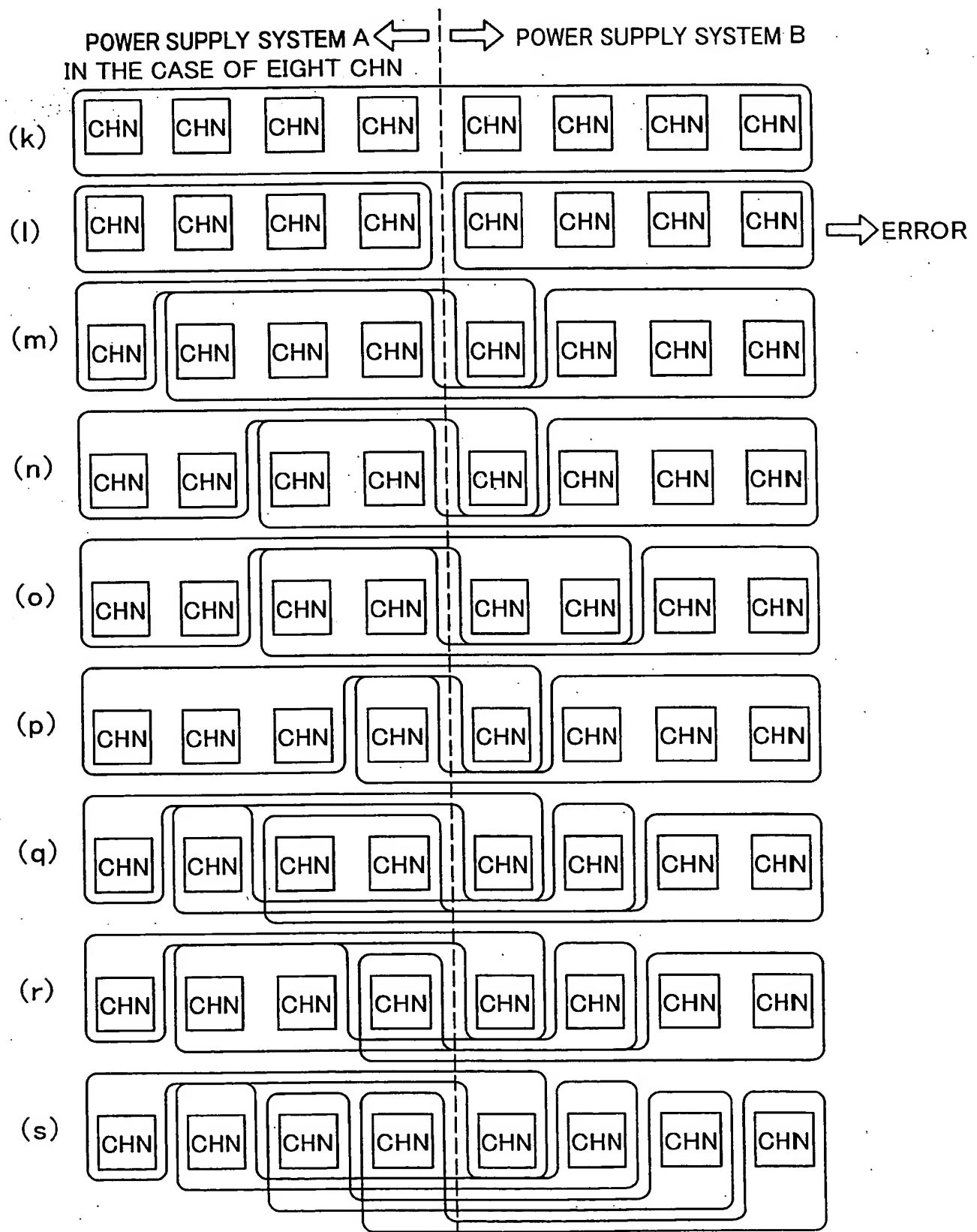


FIG.42



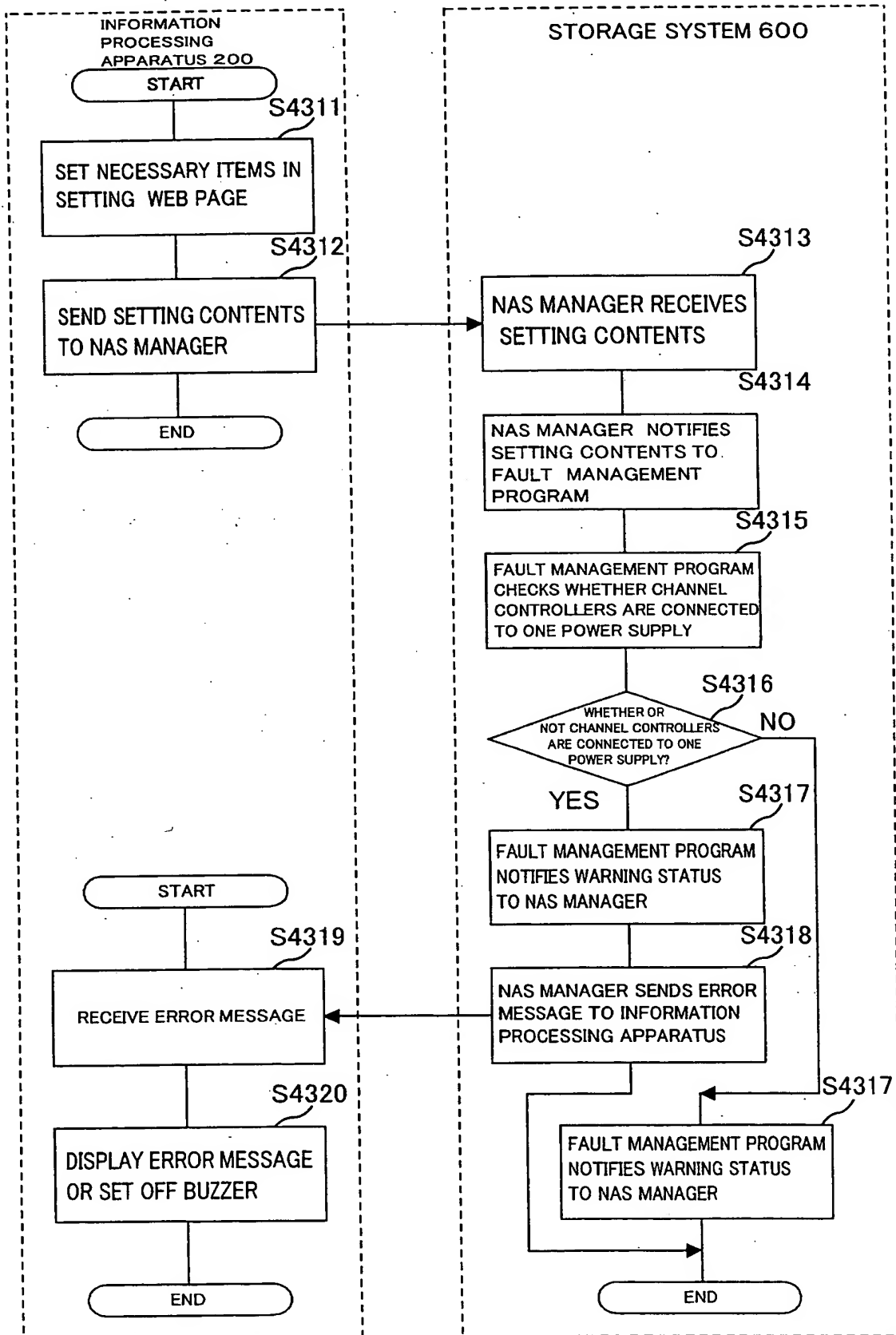
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FIG.43



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FIG.44

4400

POWER SUPPLY SYSTEM	SLOT No.	BOARD ID	TYPE OF BOARD	TO-FAIL-OVER 1		TO-FAIL-OVER 2	SHARED LU	
A	1	a	CHN	2	▽	3	▽	58
B	2	b	CHN	3	▽	4	▽	58
A	3	c	CHN	4	▽	1	▽	58
B	4	d	CHN	1	▽	2	▽	58
A	5	e	CHF	6	▽	—	▽	132
B	6	f	CHF	5	▽	—	▽	132
A	7	g	CHA	8	▽	—	▽	47
B	8	h	CHA	7	▽	—	▽	47

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FIG.45

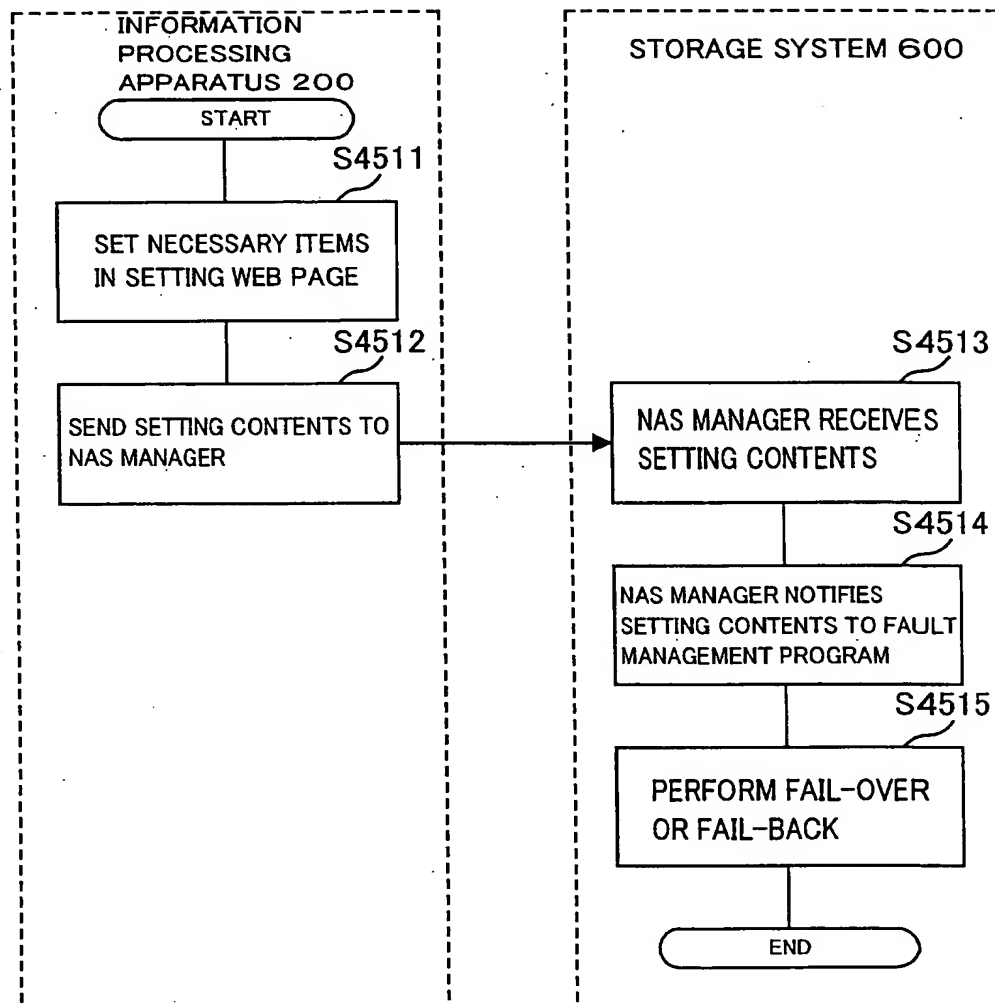


FIG.46

4600

BOARD ID	TYPE OF BOARD	STATE	TO-FAIL-OVER	FAIL-BACK ENABLING
a	CHN	RUNNING		▼
b	CHN	RUNNING	3	▼
c	CHN	RUNNING		▼
d	CHN	FAIL-BACK ENABLING	1	ENABLED ▼
e	CHF	RUNNING		▼
f	CHF	RUNNING		▼
g	CHA	RUNNING		▼
h	CHA	RUNNING		▼